

## DENTIGEROUS CYST OF THE LOWER JAW.<sup>1</sup>

SITUATED AT THE SYMPHYSIS MENTI.

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THE patient, a man, twenty-one years of age, at the age of sixteen years first noticed a lump, the size of a small marble, below the lower left canine tooth, which slowly and gradually increased in size until a year ago, since which time it has rapidly enlarged, without, however, causing any pain or real discomfort. During this period the canine tooth had gradually become displaced, and lay horizontally on the enlarged alveolar border. Four years ago patient had the second molar, on lower jaw, of left side removed, on account of toothache. He had no trismus, or difficulty in mastication, previous to seeing the dentist. Speech has been rather thickened during the past year. There is no specific history.

When first seen by the reporter, he was anæmic, and presented a rather uniform swelling of the lower jaw, extending from the anterior border of the masseter muscle on the right side to the angle of the jaw on the left.

There was no solution of continuity of skin over this area, or evidence of acute inflammation. The skin was smooth, somewhat tense, and movable.

The lower lip was swollen and pushed outward, the tongue protruded between the lips. He constantly dribbled saliva. He was unable to open his mouth beyond a space of 3 centimetres, and stated that he could not then masticate any food, and was living upon liquids.

On separating the lips, it was evident that the lower left canine tooth was missing; occupying its site was a circular opening, 1 centimetre in diameter; the remaining teeth of the mandible were apparently normal. There was considerable gingivitis along the whole alveolar border.

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<sup>1</sup> Read before the Medical Society, District of Columbia, May 17, 1905.

On the posterior aspect of the symphysis was felt a firm, resistant, bulging mass, destroying the normal contour of the bone, and extending in a direct line from molar to molar on either side. The anterior surface was compressible. The glands in the neck were not enlarged.

On insertion of a probe through the opening, left by the extracted lower left canine tooth, a cavity extending 4 centimetres to the right of the opening and 4 to 5 centimetres on the left could be mapped out. On the left side several smaller pockets or cavities were detected with the probe. Upon pressing the point of the probe, which was within the cavity, anteriorly towards the skin it met with no bony or shell-like resistance, and at any portion within the area of the cavity anteriorly the probe point could be distinctly outlined, demonstrating, anteriorly, destruction of the bone and periosteum.

At the extreme left lateral portion of the cavity denuded bone was felt. The anteroposterior width of the space was apparently about 3 centimetres.

Cultures were made from different parts of the cavity, but it was later found that infection from the mouth flora was too great to permit of any deductions being made therefrom.

Temperature in axilla, normal.

October 28, 1904, a mesial incision was made from the mucocutaneous border of the lip to the hyoid bone. The separation of the tissues disclosed an ugly looking necrotic cavity. The periosteum and bone substance on the anterior aspect of the mandible; above, from the alveolar margin to the protuberentia mentalis below, and laterally so far as the tissues of the wound could be extended on either side, showed complete destruction of periosteum and bone. Sufficient room not being obtainable by the mesial incision, the lip was cut through, and lateral incisions were made below the chin, to the anterior borders of the masseter muscles on either side, from the median incision, and the flaps reflected.

On the inner surface of the muscle of the reflected flaps were seen patches of necrotic periosteum adherent to infiltrated muscle tissue; these were carefully clipped away.

The mylohyoideus, geniohyoideus, and genioglossus muscles, with the periosteum, were then detached posteriorly, mucous membrane incised anteroposteriorly, the necessary teeth ex-

tracted, the jaw sawn through at the second molar on the right, and at the last molar tooth on the left side. The mucous membrane was brought together by running suture, thus closing the wound within the mouth. The detached mylohyoid muscles were brought forward to the chin wound and sutured. There was practically no loss of blood during the operation. The anæsthetic was taken very badly.

Impressions were made by a dentist of the teeth remaining on the stumps on either side of the jaw,—two on the right and one on the left. From the impressions he made gold crowns, which were snugly fitted over the teeth; soldered to these crowns were two heavy strands of platinum wire bent to the shape of the mouth. Before application, this prosthetic measured from crown to crown 1 centimetre more than the space between the teeth; that is to say, a line drawn from the molar on the right, across the tongue to the molar on the left, was about 1 centimetre shorter than the prosthetic appliance. This acted beautifully as a splint and spring, gave no discomfort to the patient, and prevented any contraction towards the middle line by the stumps. It also prevented falling in of the lower lip and allowed perfect cleansing of the mouth and mucous membrane line.

At the end of four weeks the wire frame was encased in a hard rubber plate, which the patient is still wearing. This plate is grooved below in its whole length. An upgrowth of tissue is now taking place within the grooved space, which will give a firmer base for the plate, and later it is the intention to make a new plate, with teeth attached, for cosmetic and serviceable purposes. At present the patient gets along very well with the appliance as it is. He has no difficulty in removing and replacing the plate at will, so that it can be thoroughly cleansed (Figs. 1 and 2).

In operations of this character on the jaw, where a complete solution of continuity has been made, the difficulty has always presented itself as to the best method to overcome the inevitable contraction inward of the stumps, Lallemand<sup>1</sup> reports a case in which a space only 2 centimetres remained between the stumps after cicatrization of the attached muscles.

Martin,<sup>2</sup> of Lyons; Fritzsche,<sup>3</sup> Nux,<sup>4</sup> Stoppany,<sup>5</sup>



FIG. 1.—Showing result of removal of dentigerous cyst of mandible; prosthetic appliance held in hand.



FIG. 2.—Showing result of removal of dentigerous cyst of mandible; profile view.

Partsch,<sup>6</sup> Sachse B.,<sup>7</sup> Bonneken,<sup>8</sup> and others have devised various so-called artificial jaws for overcoming defects left by displaced bone. The plan adopted in this case is simpler than any of the methods I have so far been able to find recorded, and is, in fact, the only case I know of where the prosthetic has been made and applied in this way. Its use is naturally limited. In a case where no teeth remain to which to attach crowns, it would of course be useless, but where indicated, it avoids the use of bolts, nuts, nails, etc., boring holes in the stumps, and leaving channels for mouth infection.

A bandage supporting the chin was kept on the patient during his stay in the hospital. He left the institution well two weeks after the operation.

I am indebted to Dr. J. C. Bloodgood, of Johns Hopkins, for a pathological report of the specimen, which is as follows:

*Gross Pathological Diagnosis; Dentigerous Cyst of Lower Jaw.*—There is a bone capsule present everywhere except anteriorly. Here the bone is absent, and there is an irregular opening about 3 by 4 centimetres.

The bone is very thin. In the single cavity there are bony partitions. There is an opening on the alveolar border corresponding to the extracted canine tooth.

In the cavity I can make out a definite connective-tissue lining which can be separated, leaving normal bone behind. There is in addition, on top of this membrane, a hæmorrhagic granular friable tissue that does not look like adamantine epithelioma, but somewhat like giant-cell sarcoma, or a partly organized bloody exudate.

*Microscopic Study.*—In a section of the cyst wall, 1 millimetre thickness, stripped from bone capsule, the wall towards the bone is composed of a myomatous connective tissue containing numerous blood-vessels. The surface of the wall is lined by a pretty thick layer of epithelial cells of the adamantine type. The basal cell has a spindle nucleus perpendicular to the basement membrane.

In the next layer the spindle cell in some places is perpendicular, in others parallel. The nucleus is still spindle. More superficially the cell assumes the typical stellate adamantine form. The nucleus of the cell in the superficial layer is round, the cell larger, and hardly takes the stain. Such is the degeneration seen in the adamantine epithelium beneath this epithelial lining; in places there is slight lymphoid cell infiltration and some polynuclear leucocytes.

In a section of the granular tissue within the cyst wall, the histology is about similar to that of the section already described. It is lined by the same adamantine epithelium, which is broken and de-

stroyed in places; the connective tissue is more vascular. There are large areas of hemorrhage and organized blood-clot. There are no giant cells, no evidence of tuberculosis. The adamantine epithelial lining shows no atypical downgrowth.

*Diagnosis.*—Jaw, benign dentigerous cyst; lined by adamantine epithelium. The first case observed.

*Note.*—This is the first simple dentigerous cyst that I have observed to be distinctly lined by a layer of adamantine epithelium.

The histological picture above described, showing a distinct layer of adamantine epithelium on a dentigerous cyst membrane, would seem to add further to the proof of the conclusions of Malessez and Witzel, that the dentigerous cyst, cystadenoma, and adamantine epithelioma of the lower jaw all have one etiological factor to start from, namely, the so-called "débris épithéliaux paradentaire" of Malessez. It has also been shown that this débris remains in the bone substance of the lower jaw during adult life.

This case differs from the so-called adamantine epitheliomata and cystadenomata in showing no invasive or irregular appearance in its epithelial structure.

Here we have a distinct layer of adamantine epithelium without downgrowth or apparent malignant change. Probably only temporary.

Steensland,<sup>9</sup> in his latest contribution to the subject, acquiesces in the conclusions of Malessez<sup>10</sup> as to etiology of the adamantine epitheliomata of the jaw. And Pincus,<sup>11</sup> in his article on "Centrale Kystadenone Keifer," states that all authors are agreed as to the conclusions of Malessez and Witzel<sup>12</sup> regarding the causation of these tumors. Cumston<sup>13</sup> also agrees in these views, giving Magitôt<sup>14</sup> credit for his earlier theories along these lines.

After a careful review of all the literature on the subject of tumors of the jaw, which is very extensive, I am unable to find a single case of so-called dentigerous cyst occupying the site of the tumor here presented. In every case so far recorded the tumor has been unilateral; in this case it will be observed that it was central, causing destruction of the symphysis, and extending to the molars on either side of the jaw.

It is also the only case of so-called simple dentigerous

cyst so far described in the literature of the subject that exhibits an epithelial lining on a dentigerous cyst membrane.

In only one instance do I find a somewhat analogous case, which is reported by Becker. In Becker's <sup>15</sup> case the tumor was median; it was a single cyst with wall from 1 to 2 millimetres in thickness and lined throughout with adamantine epithelium.

Pincus and Steensland group Becker's case among their reported cases of adamantine epithelioma, cystic, semicystic, and solid, of the jaw, which they collected from the literature of the subject.

In only four instances can I find it stated in the reported cases of cystadenoma and adamantine epithelioma of the jaw that the site is medium.

In the cases reported by Bloodgood,<sup>16</sup> of dentigerous cyst, adamantine epithelioma, and adamantine epithelioma in a dentigerous cyst of the lower jaw, the cases have all been unilateral as to location.

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